A MANUSCRIPT BY TEOFILO GALLACCINI IN THE SIENA MUNICIPAL LIBRARY

BY ROSSELLA VAGAGGINI
ISTITUTO DI MATEMATICA
SIENA, ITALY

Teofilo Gallaccini (1564-1647) holds a position of particular importance among Sienese scholars of the 18th century. To attempt to circumscribe his field of study is a rather difficult task: in fact, while his early inquiries touched upon the disciplines of Anatomy, Philosophy, Literature, and Grammar, in the end he came to devote his attention mainly to Mathematics and Perspective. On this wide array of topics, he wrote about 20 treatises, of which only 1 has been published, i.e., the *Trattato sopra gli errori degli architetti* (1767, Venice, G. B. Pasquali). Among the other treatises, the one entitled *Teoriche di prospettiva scenografica* (1641) is particularly interesting. The manuscript itself can be found in Siena in the Biblioteca Comunale degli Intronati (press number L IV 4), but no mention is made of it, even by L. De Angelis and G. A. Pecci, who have chronicled the life and works of Gallaccini. This treatise is composed of 167 folios (size 22 × 30) and is amply illustrated with line drawings in geometry, architecture, perspective, and scenography. It is divided into eight books, each of which in turn is divided into chapters.

After a first introduction on Euclidean geometry, a second on architecture--in which Gallaccini describes the five architectural orders (Tuscan, Doric, Ionic, Corinthian, and Composite)-- and a third on painting, the entire First Book is devoted to philosophical, historical, and literary aspects of perspective.

In the Second Book, however, Gallaccini begins to develop the most interesting part of the treatise, i.e., the construction of a hypothetical-deductive system for perspective. The author asserts that every science and every art has its various terms and principles without which it cannot function or provide any sort of demonstration. Thereupon follows a discussion which identifies these principles; these in turn are broken down into *external principles and internal principles*. The external principles are: the eye, the medium (diaphanous body), and the shining body lighting the medium. The internal principles include point, line, and surface.

In order to define these terms, it is essential to grasp the distinction Gallaccini makes between the subject of scenography and the subject of mathematics. In fact, in folio 27 he writes that the *subject of mathematics is quantity while the subject of scenography is quantity with the condition that it must be visible.*

Thus the first internal principle of scenography, namely, point, will be different from that of geometry in that it has some degree of size, and hence it will be that which has parts. In similar fashion, the second internal principle of scenography, line, will be length having some degree of width; it is different from the geometric line in that it is visible and is divisible also along its width. Finally, the third internal principle, surface, will be different from the geometric one due to the color and light and shadow that lie on it.

In the Third Book these three primitive concepts, set out in rather concise, rigorous terms, are followed by 17 definitions, among which it would be well to remember Number 5: *Parallel lines in scenography are those which, when continually extended, join together.* There follow six axioms, of which Number 1 is worth noting: *Distance takes away the natural size from the things we look upon so that they appear smaller.* The remainder of this book contains numerous propositions, with their corresponding proofs, on *visual lines,* namely, those lines which depart from the eye and come to rest on the object.

The Fourth Book begins with the construction of the *digradato* (seen in perspective) square and circle and then goes on to examine the construction in perspective of the regular figures (the regular triangle, pentagon, hexagon, octagon, and decagon).

The Fifth Book studies *irregular figures,* which, instead of begin derived from the circle--like the regular figures--are derived from the oval. Thus, for example, Chapter 2 is devoted entirely to the construction of shields, or weapons which are placed within walls; Chapter 4 considers star-like figures; Chapter 7 discusses the conch; and so on.

In the Sixth Book, entitled *De corpi solidi,* Gallaccini draws a distinction between regular and irregular bodies, citing as references for the construction of the five Platonic solids the treatises of Daniele Barbaro (*La pratica della prospettiva,* 1569, Venice) and Lorenzo Sirigatti (*La pratica della prospettiva,* 1625, Venice). He limits his study to the cube and approaches it by investigating its development on a flat plane and its recomposition. Then he goes on to representations in perspective of eight of its position or different aspects.

The irregular bodies form the subject of the Seventh Book. Exactly what is meant by an irregular body is not specified; however, various forms are presented as studies in perspective, among which are architectural fragments, a horse's shape, a vase and its pedestal, and so on.

With the study of the scenic representation Gallaccini passes from the theoretical phase to the practical one. Here, however, he does not dwell on example, as do many of his contemporaries, but chooses to follow a precise working plan. First of all, he classifies scenic representations into four types (Plane, Ascending, Descending, Mixed) which are then subdivided according to

the position of the vanishing point, i.e., the point toward which all the parallel lines of a scene converge. To the location of the vanishing point of the scene he dedicates an entire chapter in which is found a construction to help determine the position of that point. The remaining chapters contain descriptions (which are examples of rigor and clarity) of constructions of the different types of scenes analyzed earlier.

The Eighth (and final) Book concludes with an outline for a Ninth Book on choregoraphy and on the acoustical effects of artistic representations. However, there is no further information about this book.

The author of this note believes that a detailed examination of this treatise would be a worthwhile object of study, especially for the logico-mathematical considerations it offers. However, such a study cannot afford to neglect the historical and philosophical background of the work and its place within the history of the theory of perspective.